

20.3: Data and Analysis

Data Collection (25 points)

Following your detailed protocol, perform all the experiments. Record your observations and take pictures of your key steps in the process. Your observations and images need to be incorporated in your data section and this section should be as detailed as possible as you will use this information to complete your discussion.

Take every measurement 3 times and then average the values for best accuracy. Find both the mass and the volume for every object you investigate.

Part 1: Find the mass of a regular object.

Object name	Mass 1	Mass 2	Mass 3	Average

Part 2: Find the volume of a regular object.

Object name	length	Width	Height	Volume
	Average	Average	Average	Average
	Average	Average	Average	Average

Part 3: Find the mass of an irregular object.

Object name	Mass 1	Mass 2	Mass 3	Average

Part 4: Find the volume of an irregular object.

Object name	Initial Volume	Final Volume	Difference

Object name	Initial Volume	Final Volume	Difference
	Average	Average	Average
	Average	Average	Average

Data Processing (25 points)

1. Find the density of a regular and an irregular object:

Object name	Mass	Volume	Density	Known value

2. Calculate the % error in the density calculations using the following formula:

$$\% \text{ error} = \frac{(\text{experimental value} - \text{true value})}{\text{true value}} \times 100\%$$

Make this number positive (take the absolute value). Your instructor will have the true values.

3. Fill in the following table using the observations and data from your experiments.

Assumptions made	Testing the assumption	If assumptions are wrong ...
The distilled water is pure	Evaporate it and check for residue	The density would change depending on the density of the contaminant
The objects used for displacement does not absorb water	Take the mass before placing in water and again after it was removed from water and dried	
Mass shown on the scale is accurate		Different scales show different mass for the same object

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